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### (54) Multi-beam satellite communications system

(57) A satellite communications system having ground user terminals, hubs, and a geosynchronous satellite. The satellite generates a network of spot beam coverage areas on the earth. A hub and at least one ground terminal are located in each of at least two spot beams. A first user terminal transmits an uplink signal according to a first signal protocol to the hub through the satellite. A second user terminal receives a downlink signal according to a second signal protocol through the downlink spot beam from the hub through the satellite. The hub may be located in the same spot beam coverage area as the first or the second user terminal or may be located in an altogether different spot beam coverage area. Through selective frequency and/or polarization routing on board the satellite, a hub located within a "parent" beam can communicate with user terminals within the parent beam at a specified frequency and polarization, and can communicate with users in other "dependent" beams on a different frequency and/or polarization. This routing allocates the total available bandwidth between parent and dependent beams. The system enables asynchronous communications between each hub and the satellite to maximize frequency re-use and the overall capacity of the system.

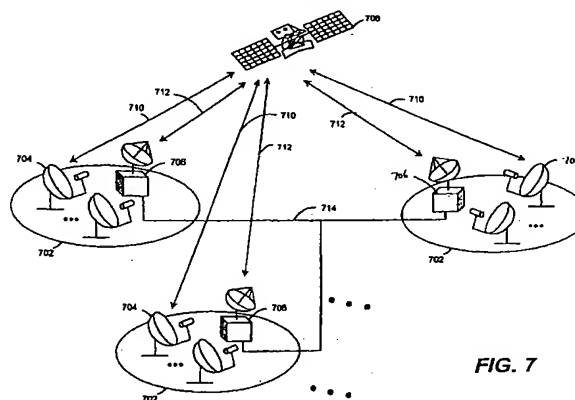


FIG. 7



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# EUROPEAN SEARCH REPORT

Application Number  
EP 03 01 6070

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 29 August 2005	Examiner Dejonghe, 0
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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# EUROPEAN SEARCH REPORT

Application Number  
EP 03 01 6070

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Place of search The Hague		Date of completion of the search 29 August 2005	Examiner Dejonghe, O
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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